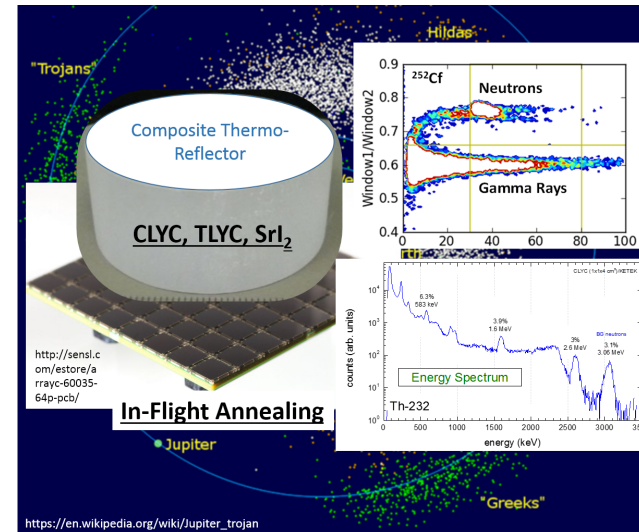


PI: Erik Johnson

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### Identification and Significance of Innovation

The hostile environments of the inner planets and Jupiter cause radiation sensors using scintillation materials to fail over a short life span, where annealing can lengthen the operational life, and large crystals in compact satellite that require solid-state photomultipliers require cooling. The goal of this project is to develop a scintillator detector module for gamma ray and neutron detection that will provide mitigation strategies for reducing radiation and temperature effects.



Estimated TRL at beginning and end of contract: ( Begin: 3 End: 4 )

### Technical Objectives and Work Plan

1. Determine the annealing parameters for exposed scintillation materials for a dose up to 100 kRad from 200 MeV protons.
2. Develop a highly reflective (>90% from 300 to 700 nm) composite material with high thermal conductivity (>2.5 W/m/K).

### NASA Applications

Radiation detectors are an invaluable tool for space applications that span planetary science, astrophysics, heliophysics, space weather, and dosimetry for human exploration, to name a few. The instrument will be design to accommodate missions to hostile environment such as Venus, Mercury, and Jupiter.

### Non-NASA Applications

Radiation Detectors (PRD)  
Spectroscopic Radiation Detectors (SPRD)  
Radioisotope Identification Devices (RIIDs)  
Area Monitors, and stand-off detectors.

### Firm Contacts

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